REPORT TO THE CHAIRMAN
COMMITTEE ON POST OFFICE
AND CIVIL SERVICE
UNITED STATES SENATE

Observations On The Preferential Mail System

B-114874

United States Postal Service

BY THE COMPTROLLER GENERAL
OF THE UNITED STATES

OCT. 30, 1973

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-114874

The Honorable Gale McGee
Chairman, Committee on Post Office
and Civil Service
United States Senate

Dear Mr. Chairman:

In response to your request of August 1, 1973, we are providing you with our observations on the Preferential Mail System of the United States Postal Service and its impact on service delivery standards. This report also discusses alternative methods of processing letter mail.

As requested by your office, we have discussed this report orally with Service officials but have not requested the Service or the firms mentioned in the report to review or formally comment on the report.

As agreed to by your office, we are transmitting a copy of this report to the Chairman, House Committee on Post Office and Civil Service and the Postmaster General.

Sincerely yours,

Elmer B. Staats

Comptroller General
of the United States

Contents

ABBREVIATIONS

AOCR	advanced optical character reader
CSC	Computer Sciences Corporation
CSOCR	code-sort optical character reader
GAO	General Accounting Office
IBM	International Business Machines, Inc.
LMCSS	Letter Mail Code Sort System
LSM	letter sorting machine
OCR	optical character reader
PMC	Preferential Mail Center
PMS	Preferential Mail System
SCF	Sectional Center Facility
TPO	transfer post office
ZIP	zone improvement plan
ZMT	ZIP mail translator

COMPTROLLER GENERAL'S REPORT
TO THE CHAIRMAN,
COMMITTEE ON POST OFFICE
AND CIVIL SERVICE
UNITED STATES SENATE

OBSERVATIONS ON
THE PREFERENTIAL MAIL SYSTEM
United States Postal Service
B-114874

D I G E S T

WHY THE REVIEW WAS MADE

For some time, the United States Postal Service has been studying the feasibility of putting into operation, nationwide, a highly mechanized mail-processing system--the Preferential Mail System.

The Service originally estimated--based largely on studies made by private firms--that the proposed system would require an investment of about $4 billion and would reduce operating costs by about $1 billion a year.

The Chairman, Senate Post Office and Civil Service Committee, requested GAO's observations on the system as presently conceived. As requested by the Chairman's office, GAO did not request the Service or the firms mentioned in the report to review or formally comment on the report.

The Service has deferred action on the Preferential Mail System until:

--Certain sophisticated mail processing equipment which is an integral part of the system currently being tested at the Cincinnati, Ohio, Post Office has been successfully demonstrated.

--The Service has proved that it has the technical and managerial ability to implement the National Bulk Mail System--another nationwide system, costing about $1 billion.

FINDINGS AND CONCLUSIONS

The study made for the Service by a contractor analyzed two basic types of mail processing equipment and two alternative letter mail processing systems. GAO's evaluation of these analyses and of the equipment performance showed that:

--The study overstated the economic advantages of a new type of equipment--the Letter Mail Code Sort System--relative to the type of equipment in use or under development. (See p. 9.)

--The new type of equipment has not yet been proven in the field. (See p. 15.)

--The study overstated the advantages of a new network of about 180 processing centers relative to the less expensive alternative of 588 centers, generally the same as the existing system. (See p. 16.)

Mail massing at the 180 processing centers as recommended by the contractor could cause mail service quality to deteriorate. (See p. 18.)

Overall, the Service's decision to defer action on the Preferential Mail System is well founded.

CHAPTER 1

INTRODUCTION

As part of its continuing search for ways to improve the economy and effectiveness of its operations, the Service has been studying the feasibility of putting into operation, nationwide, a highly mechanized mail processing system--the Preferential Mail System (PMS). The proposed PMS is based largely on the results of studies made for the Service by the Computer Sciences Corporation (CSC) and the International Business Machines, Inc. (IBM). CSC was responsible for studying the economic advantages of alternative letter mail processing systems, and IBM was responsible for assisting in the development of the PMS network and for testing and integrating the prototype equipment at the Cincinnati, Ohio, Post Office. The Service assumed in-house control of this equipment when the IBM contract expired September 30, 1973.

The Service plans to invest about $4 billion in the proposed PMS--$1.9 billion for equipment, $1.4 billion for facility construction and modernization, and $0.7 billion for research and development and system integration. The Service estimates that it will save about $1 billion a year after PMS is put into operation primarily because using certain sophisticated mail processing equipment--the Letter Mail Code Sort System (LMCSS)--should help the Service reduce the number of mailhandlers and mailclerks. PMS will handle letters, cards, and certain other types of preferential mail, such as rolls of film.

PMS objectives are

--to reduce costs by replacing the manual distribution operation with more economical mechanized operations;

--to decrease the time required for processing and delivering letters and provide more consistent letter delivery by providing for next-day delivery within a Preferential Mail Center (PMC) service area and second-day delivery within the continental United States for 95 percent of the letter mail;

--to improve productivity, quality of service, and efficiency by centralizing processing functions;

--to provide the capacity and capability to handle the growing volume of letter mail; and

--to provide flexibility to accommodate future customer requirements and changing market conditions.

The Service has deferred action on PMS implementation until (1) LMCSS equipment--an integral part of PMS--has been successfully demonstrated and (2) the Service has proved that it has the technical and managerial ability to implement the National Bulk Mail System.[1]

Under PMS, most mail processing operations of about 32,000 post offices will be handled by 181 PMCs. Certain sectional center facilities (SCFs) have been designated as PMCs, and the remaining SCFs will function as transfer post offices (TPOs), each of which will be assigned to a PMC. TPOs will serve as mail transfer points where mail from surrounding associate post offices will be consolidated for dispatch to the PMC. PMCs will be designed and equipped for processing preferential mail (letters) and will be separate from the National Bulk Mail Centers.

PMC location selection was based primarily on service requirements (days to deliver mail) and on the estimated operating costs that would be incurred in handling the estimated 1981 daily volume of letter mail. An important consideration was that the volume of letter mail be sufficient to effectively use LMCSS equipment. LMCSS, as designed, is capable of processing only letters and cards within certain size limitations; the remaining preferential mail and certain odd-size letters and cards will be processed using current mail processing procedures or equipment currently under development.

Under PMS, mail destined for a location within the area a PMC serves may travel from an associate post office to a TPO and then to a PMC for sorting and processing. The mail then will move from PMC to a TPO for distribution to the

---

[1]A $1 billion system of 21 mechanized bulk-mail facilities and 12 auxiliary service facilities which will generally handle parcels, circulars, and nonletter mail.

appropriate associate post office for delivery. The following diagrams show this mail flow.

DIAGRAM 1

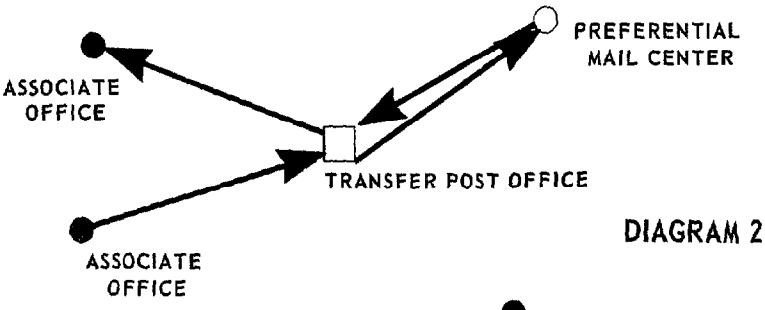
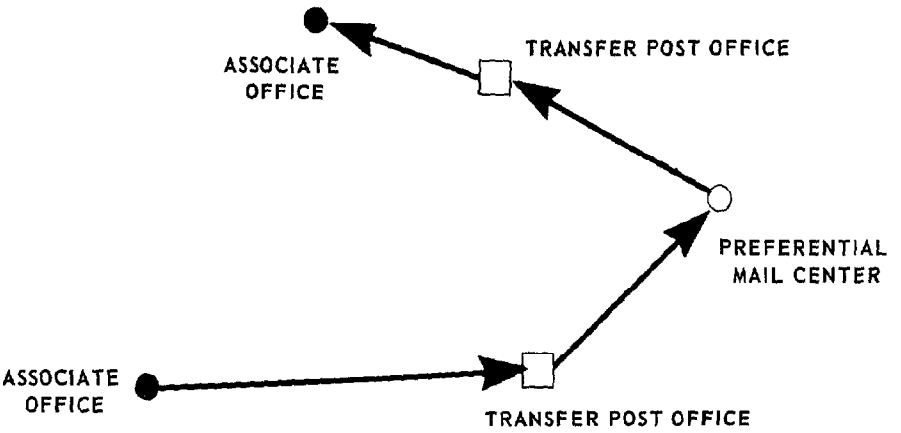
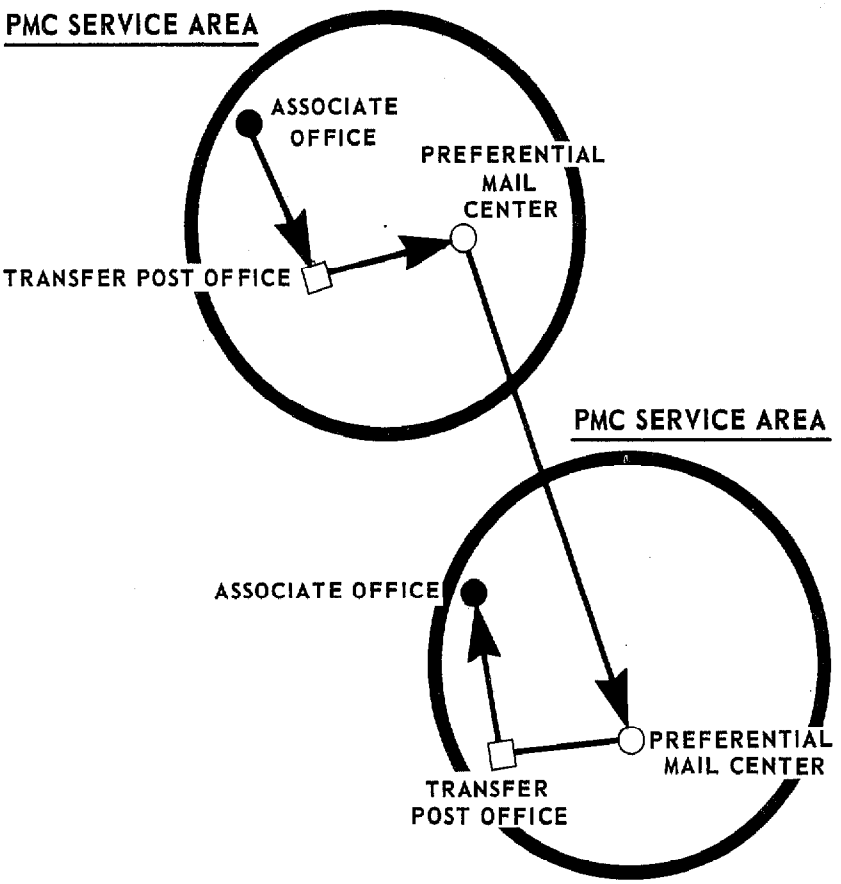


DIAGRAM 2



Mail originating in one PMC destined for a location in another PMC area may be moved from the first PMC to the second PMC and then to a TPO for distribution to the appropriate associate post office, as shown by the following diagram.

DIAGRAM 3



Mail can also be moved directly from an associate post office to a PMC and then to another associate post office or PMC without passing through a TPO, as shown by the following diagrams.

DIAGRAM 4

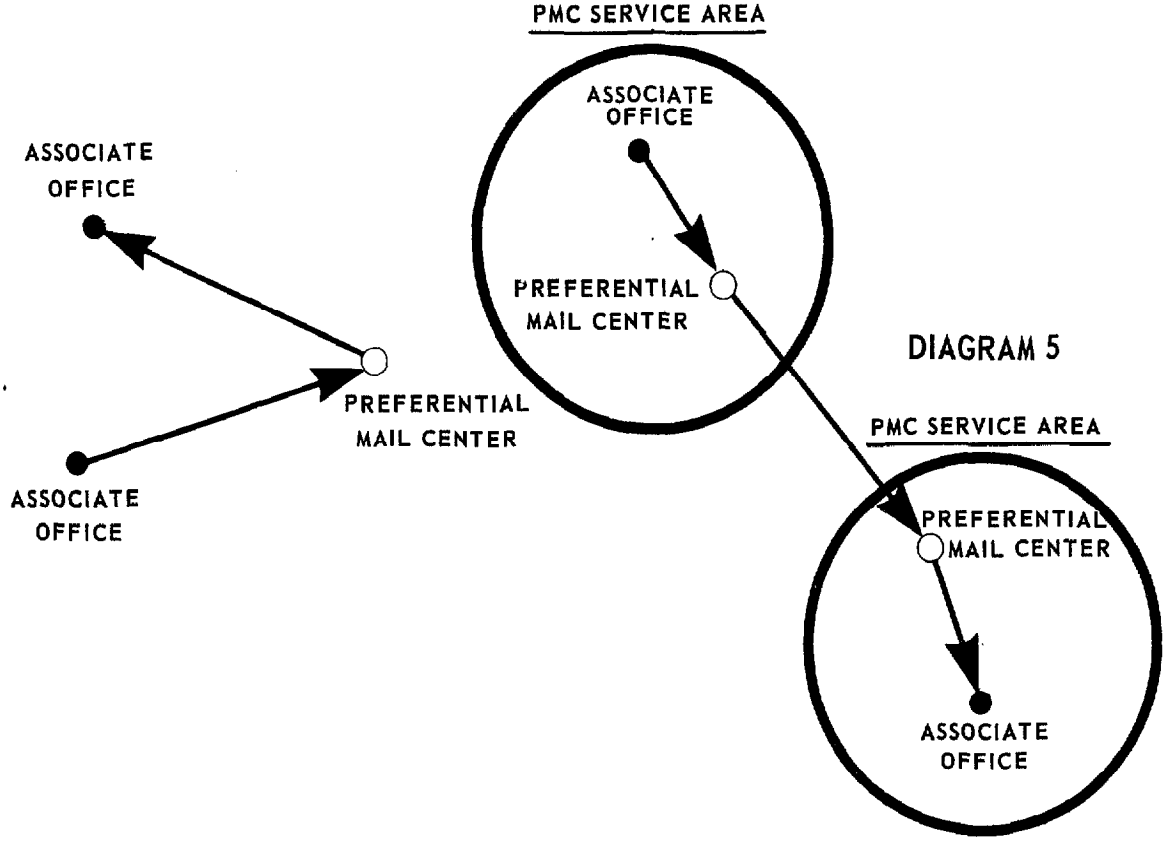


DIAGRAM 5

Since September 1970 the Service has been testing, at the Cincinnati Post Office, a prototype LMCSS. In a report (B-114874, Nov. 8, 1972) to the Postmaster General on our evaluation of this LMCSS prototype we said that LMCSS was not meeting Service performance standards and was more costly than the existing letter mail sorting system. Because of the problems with this LMCSS prototype, the Service decided not to purchase LMCSS equipment for other post offices.

CHAPTER 2

DESIRABILITY OF PMS NOT YET DEMONSTRATED

In its study, CSC analyzed two basic types of mail processing equipment and two alternative letter mail processing systems. Our evaluation of the analyses that CSC made in a June 1972 report to the Service and our evaluation of the equipment performance showed that:

--CSC overstated the economic advantages of a new type of equipment--LMCSS--relative to the type of equipment currently in use or under development.

--LMCSS equipment has not yet been proven in the field.

--CSC overstated the advantages of a new network of about 180 processing centers relative to the less expensive alternative of 588 centers, generally the same as the existing system.

In addition, mail massing at 180 processing centers as recommended by CSC could cause mail service quality to deteriorate.

NEW EQUIPMENT ADVANTAGES OVERSTATED

CSC analyzed two systems of processing letter mail--read-sort and code-sort. In the code-sort system, a machine-readable code is placed on the envelope the first time the address is read, which allows the letter to be sorted by machine during all subsequent sorts; in the read-sort system, the address on the envelope is read; either manually or by machine, each time the letter is sorted. PMS relies on the code-sort system, whereas the current processing system relies on the read-sort system. In its study, CSC overstated the economic advantages of the code-sort system, because it made several questionable assumptions.

The read-sort system may use a manual or a machine operation or it may use a combination manual-machine operation to sort the letter to the carrier for sequencing. The current system relies primarily on manual or manual-machine operations; it has not taken full advantage of mechanization.

In the manual operation, a mail distribution clerk reads the address on the envelope and then places the letter in the proper destination bin. In the manual-machine operation, a console-type machine--the letter sorting machine (LSM)/ZIP[1] mail translator (ZMT)--automatically places a letter in position for a clerk to read the address. The clerk then keypunches an address code (based on the ZIP code) into the machine which mechanically or electronically places the letter in the destination bin indicated by the code. In a completely mechanized operation, an optical character reader (OCR) attached to LSM will read the address and then, by computer control, the letter will be mechanically or electronically placed in the proper LSM destination bin.

Most OCRs can read only certain machine-printed addresses. However, a recently developed advanced optical character reader (AOCR) which has a much faster processing capability and which can read most machine-printed addresses is currently being tested in a New York postal facility. In all three operations, the address on the envelope is read each time the letter is sorted until final distribution.

LMCSS to be used in PMS uses the code-sort system in which the address on a letter is translated into a machine-readable bar code printed on the envelope. LMCSS uses both manual-machine and machine operations in processing mail. In the manual-machine operation, a manual encoding desk places the code on the letter. In this operation, a clerk reads the address, extracts certain characters according to specified extraction rules, and impresses keys on a sequential typewriter keyboard, which causes a code to be printed on the envelope.

In the machine operation, OCR reads the address, and a printer attached to OCR prints the code on the envelope. The Service plans to encourage major mailers to precode their mail, which will reduce the amount of coding and processing. Imprinting a machine-readable code on the letter, by either an encoding desk or OCR, the first time the address is read allows the letter to be sorted by a code reader/LSM on all subsequent sorts.

---

[1]Zone improvement plan.

CSC analyzed several configurations of code-sort and read-sort systems. One configuration used the highest level of mechanization in both the code-sort and read-sort systems. In this configuration both systems use AOCRs. Both systems require a manual sorting system to sort odd-size letters which cannot be processed through the mechanized system. Such mail is separated from mail capable of being processed by machines when it goes through the mail preparation line.

Both the read-sort system and the code-sort system AOCR configurations use a machine called an enricher to separate letter mail with handwritten addresses from machine-addressed mail.

AOCR under either system will not be able to read handwritten addresses or addresses with poor print quality. Under the code-sort system, mail with such addresses will be routed to a manual encoding desk where it will be coded. After the mail is coded, it will be sorted by a code reader/LSM. Precoded mail will only require sorting by a code reader/LSM and will bypass all other operations except the "sortation to the carrier stop" which is the last sorting operation. The Service plans to develop a mechanical carrier sequencer to perform this function in the code-sort system.

Under the read-sort system, handwritten mail or mail with poor print quality is sent to a LSM/ZMT for sorting. Because the LSM/ZMT sorts mail by ZIP code, mail that does not have the ZIP code on the envelope must generally be sorted manually. LSM/ZMT cannot economically sort letters to the carrier route because the operator must know the routes covered by each letter carrier in one or more postal stations, whereas, under the code-sort system, the code contains all of the necessary information to mechanically sort the mail to the carrier route. In addition, under the read-sort system, the carrier would have to manually sequence all of his mail.

Letter mail must go through several sorts from the time it is mailed until it reaches the carrier or the post-office box. The major advantage of the code-sort system is that coded letters can be sorted by mechanized code reader/LSMs instead of the more expensive AOCR/LSMs or the mechanized/manual LSM/ZMT operation. Appendixes II through V show the simplified mail flow under the read-sort and code-sort systems.

Economic benefits of alternative letter mail processing systems

CSC computed savings by substracting the variable processing costs of the proposed mechanized systems from the variable processing costs[1] of the present system. Annual investment costs[2] were offset against the annual savings to arrive at a cash flow to be able to compute a rate of return. The rate of return was computed for each equipment configuration included in the analyses.

CSC has concluded from its analyses that the code-sort system is more cost effective than a highly mechanized read-sort system. Its report shows that, although there is little difference between the rates of return for the AOCR code-sort system and the AOCR read-sort system (20.8 percent for code-sort and 19.8 percent for read-sort), the code-sort system would result in savings of about $12 billion as opposed to savings of about $7 billion for the read-sort system. The investment costs would amount to about $4.7 billion for the code-sort system and about $2.6 billion for the read-sort system. The difference in total savings and investment costs was partially attributable to the use of a mechanical carrier sequencer to sequence the coded mail by address on a letter carrier's route. This sequencer is economical only through the use of a bar code, such as that used in LMCSS. Under the AOCR read-sort system, as seen in the CSC study, the letter carrier would have to manually sequence his mail.

CSC indicated that the processing cost of the code-sort system, including the mechanical sequencer, was $2.88 per thousand letters less than the cost of the read-sort system.

The CSC study, however, included many assumptions concerning the operating capacities and costs of various pieces and combinations of equipment and the amount of precoded and presorted mail processed under each system. These assumptions were necessary because actual data, particularly

---

[1]Primarily consists of labor costs.

[2]Facilities, research and development, and system integration and control costs.

for the code-sort system, was limited. Our analysis indicated that several of these assumptions were questionable. We therefore made changes to CSC's computer programs to correct what we believed to be "questionable" assumptions, and to arrive at a more realistic cost for each system. We discussed these changes with CSC officials who, for the most part, agreed with our changes. (See app. VI which discusses our changes and the comments made by CSC officials.)

Our evaluation of the two letter mail processing alternatives showed that, after making the changes mentioned above, the processing cost of the code-sort system, using the mechanical carrier sequencer, was $1.62 per thousand letters less than the cost of the read-sort system. However, there is some question concerning the feasibility of the mechanical carrier sequencer. Although this equipment has been under study and development since 1969, a suitable machine has yet to be developed. Under the cost and operating characteristics CSC used, the mechanical carrier sequencer would be cost effective; however, the development of such a machine suitable for nationwide deployment--at least in the near future--is open to question.

Because of the uncertain status of the mechanical carrier sequencer, we computed the costs of the code-sort system without this equipment. The processing cost of the code-sort system without the mechanical carrier sequencer was 4 cents ($22.01 less $21.97) per thousand letters higher than the cost of the read-sort system. The following table summarizes the results of our analysis and compares them with the cost CSC computed.

Comparison of Code-Sort and Read-Sort Alternatives for Processing Letter Mail under PMS

	Cost per 1,000 letters				
	CSC		GAO		
			Code-sort		
Costs	Code-sort with carrier sequencer	Read-sort	With carrier sequencer	Without carrier sequencer	Read-sort
Variable	$14.41	$19.72	$14.44	$17.86	$18.76
Fixed[1]	4.58	2.15	5.91	4.15	3.21
Total	$18.99	$21.87	$20.35	$22.01	$21.97

[1]Primarily equipment depreciation costs.

Even if the mechanical carrier sequencer is developed, it is questionable whether the cost difference of $1.62 per thousand letters ($21.97 less $20.35 per our computations) is great enough to justify the higher risk code-sort system which has been tested only on a limited basis without a mechanical carrier sequencer. This cost difference may also be affected by other costs, such as research and development, planning, systems integration and control, and facility costs, which were not included in the comparison. CSC estimated that such costs for the code-sort system exceeded those for the read-sort system by about $336 million.

RECOMMENDED EQUIPMENT NOT YET PROVEN

We reported to the Postmaster General in November 1972 that the LMCSS prototype the Service was testing from September 1970 at the Cincinnati Post Office was not meeting the Service performance standards and was more costly than the existing letter mail sorting system. Our followup review of performance data for January through March and for May 21 through June 15, 1973, shows that LMCSS has made little improvement since our earlier report. The following table shows the production results achieved by LMCSS equipment at Cincinnati compared to Service performance standards for May 21 through June 15.

Performance of Individual Pieces
of LMCSS Equipment
May 21, 1973, Through June 15, 1973
(19 Working Days)

Type of equipment	Actual performance to standards for equipment (note a) Lowest to highest range	Number of days below 90 percent of standard
Encoding desks	76% to 88%	19
Code-sort optical character reader (CSOCR) (note b)	65 to 94	15
Manual code desk presort unit	37 to 58	19
CSOCR presort unit (note b)	35 to 55	18
Letter sorting machine	81 to 117	2
Total system average	81.6%	

[a]Standards are set for each type of equipment depending on the expected processing capability of the equipment, and performance is measured against those standards.

[b]Machine was not operating for one of the 19 working days.

Our November 1972 report noted that LMCSS had achieved a sorting accuracy rate of only 67 percent for January 3 through March 21, 1972, compared to the projection of

91.7 percent used as a basis for the Service's economic analysis of the system. The sorting accuracy rate is the percent of letters sorted the first time requiring no further manual sorting. Our review of data for January through March 1973 showed that the sorting accuracy rate was still only 67 percent.

ADVANTAGES OF RECOMMENDED NETWORK OVERSTATED

Although PMS and its 181 processing centers appear less costly than the alternative system of 588 processing centers, the cost difference may be offset by additional transportation costs, the costs and disruption involved when changing to a new system, and facility construction costs.

CSC analyzed the code-sort and read-sort alternatives in two different network environments--a network of 177 PMCs and a network of 588 SCFs. The SCF network more closely approximates the current network for processing mail. After CSC completed its study, the Service increased the number of PMCs from 177 to 181; however, because this change would not materially affect the results of the CSC study, we continued to use the 177 network configuration in our analyses.

CSC concluded that the PMS network was more cost effective than the SCF network. CSC's report showed that PMS would result in about 10 percent more savings using an AOCR code-sort configuration and about 27 percent more savings using an AOCR read-sort configuration than would the SCF network. CSC also computed the variable processing costs per 1,000 letters in an AOCR configuration and found that the cost of the SCF network exceeded the cost of PMC by $1.42 per 1,000 letters in a code-sort system and $1.82 per 1,000 letters in a read-sort system.

Comparing processing costs under the two networks is not meaningful unless both variable and fixed costs are included. In addition, as discussed in appendix VI, we made certain changes to CSC's computer programs to correct what we believe to be "questionable" assumptions. The following table shows our computations of the variable and fixed costs per 1,000 letters for the two networks.

Comparison of Processing Costs
per 1,000 Letters in Networks
of 177 and 588 Processing Centers

Processing system	Cost per 1,000 letters		
	177 PMCs	588 SCFs	Difference
Code-sort (with mechanical sequencer):			
Variable	$14.44	$14.98	$0.54
Fixed	5.91	7.52	1.61
Total	$20.35	$22.50	$2.15
Code-sort (without mechanical sequencer):			
Variable	$17.86	$17.91	$0.05
Fixed	4.15	5.64	1.49
Total	$22.01	$23.55	$1.54
Read-sort:			
Variable	$18.76	$19.10	$0.34
Fixed	3.21	3.99	0.78
Total	$21.97	$23.09	$1.12

Although it appears that the PMS network offers more savings than the SCF network, the costs shown in the table do not include (1) additional transportation costs that would be incurred by implementing PMS, (2) facility construction costs, and (3) the nonquantifiable costs and disruptions that would occur when changing to PMS.

An IBM analysis, dated October 15, 1971, estimated that PMS would increase transportation costs, for 1970, by $44.7 million over the present system, or about 92 cents per 1,000 letters, from $5.20 to $6.12. For example, PMS implementation will increase the use of air taxis to meet Service delivery standards.

Air-taxi service costs about 85 cents a ton-mile, whereas scheduled airline service costs about 25 cents a ton-mile. Therefore, the increased use of air taxis to meet PMS Service delivery standards could result in a cost increase as high as 60 cents a ton-mile.

CSC estimated that PMS facility construction costs would amount to about $1.4 billion; but that the Service would incur 50 percent of the total cost for constructing and modernizing PMS facilities even if it did not implement the system. Therefore, the increased facility construction cost attributable to implementing PMS amounted to about $722 million, or $591 million for buildings and $131 million for land.

Changing to PMS would result in startup costs, such as the cost of transferring employees from post offices, where mail processing would no longer occur, to PMCs. The Service, because of the extended schedule for implementing PMS, has not estimated these startup costs; it has, however, estimated such costs for the National Bulk Mail System at about $71.8 million.

Implementing PMS, we believe, will disrupt normal mail processing operations which, in turn, will cause a decline in productivity. We could not determine the monetary effect of this disruption.

POSSIBLE DETERIORATION IN MAIL SERVICE QUALITY

The PMS network may not significantly improve first-class mail service and, in fact, may cause mail service quality to deteriorate in many areas. Because of the additional mileage that mail must travel (see apps. VII through IX) and the increased use of air taxis to meet Service delivery standards, particularly for intra-PMC mail, the time required to transport mail would increase. This increased transportation time may offset the faster processing time.

A Service contractor reported October 31, 1972, that, whereas PMS specified a 95-percent service delivery standard, air taxis were not capable of operating at better than an overall 90-percent ontime delivery standard. For example, of 150,000 air-taxi sectors[1] scheduled, for the year ended June 23, 1972, 10.7 percent were canceled or were completed late. This unreliability of air taxis is inherent and

---

[1]Consists of flights from one city or stop to another city or stop within an air-taxi route.

unavoidable; therefore, air-taxi costs must be considered as wholly additional costs because achieving targeted delivery standards would require a backup ground transportation system on all routes where air taxis are scheduled. Achieving a 95-percent delivery standard at any point serviced by air-taxi routes would be impossible unless such backup transportation is available.

The Service, in improving service under PMS--and its concept of massing large volumes of mail at relatively few processing centers--is faced with the problem of the effect on service of the error and reject rates of the equipment in use and the equipment planned for the new system. Under PMS, this effect will become a larger problem because mail massing will require even more mechanization. In many cases an operator or machine error causes a letter to be missent, whereas a letter that is rejected by the machine has a reduced chance of meeting delivery standards. Our review at several mechanized post offices showed that LSM error rates ranged from 2.2 percent to 13.2 percent from June 1972 through March 1973. At the Cincinnati prototype operation, from January through March 1973, about 20 percent of the mail volume was potentially delayed because of rejects, missorted letters, and letters jamming in the equipment.

Even if the Service could completely solve the transportation problems associated with mechanized processing of letter mail at large centralized processing centers, the proposed system's service delivery standards offer very little improvement over currently established delivery standards. The following table compares current Service delivery standards for first-class letter mail with the PMS standards.

Destination	Current standard	PMS standard	Difference
	(days)		
Intra-SCF and adjoining SCFs designated locally (intra-PMC)	1	1	-
600 miles (intra-PMC)	2	1	1
Inter-PMC	2	2	-
Nationwide	3	2	1

PMS delivery standards will not offer any improvement in some areas, such as intra-SCF mail. About 44 percent of the mail volume for April 1, 1972, through March 30, 1973, originated in and was destined for the same SCF area. Therefore the delivery standards would not be improved for at least 44 percent of the mail volume. In addition, delivery standards for mail which is currently inter-SCF but which is designated locally for 1-day service may deteriorate under PMS in those cases where that mail will be inter-PMC and will therefore have a 2-day delivery standard. At a maximum, PMS offers only a 1-day improvement over currently established delivery standards.

The Service has implemented a Managed Mail Program as an interim step before PMS implementation. This program provides for mail massing at State distribution centers in an attempt to cut operating costs and improve service. Our review of postal operations in several cities showed that this program could cause additional handlings, which would adversely affect service.

Mail was generally sent from the originating office to the SCF area for which the mail was destined; however, under the Managed Mail Program, mail is sent first to a State distribution center in the destination State where it is sorted and forwarded to the appropriate SCF. Service officials said that, although the program reduced mail processing costs, it delayed interstate mail at least 1 day because of the additional processing steps and that this program could cause delays because of excessive mail volume in certain facilities.

Under PMS, in those areas where letter mail cannot be processed without substantially deteriorating service, some processing and sorting may be done at TPOs or associate offices, Service officials said. This action may be necessary in many areas to prevent service deterioration and, in effect, will increase PMS operating costs.

The Service has also improved the current processing system, which, we believe, will reduce costs and improve service without a substantial capital investment. For example, the Service has:

--Refined and clarified the Managed Mail Program for eliminating the problem in mail massing.

--Increased the number of breakdowns of mail at originating post offices for moving mail directly to destinations and thereby bypassing State distribution centers.

--Installed a quality control system for improving the accuracy of LSM operators.

--Established a nationwide error control system whereby postal installations report missent mail promptly to dispatching offices for corrective action.

CONCLUSIONS

The Service's decision to defer action on PMS is appropriate. Unless the various problems discussed in this report can be resolved, it would not--as the Service perceives--be judicious to risk $4 billion on a new system that may not have any economic or other advantage over the existing system, especially considering that further improvements can be made to the present system.

We discussed this report with Service officials who generally agreed with the information presented and with CSC officials who, for the most part, agreed with our comments on the CSC study.

CHAPTER 3

SCOPE OF REVIEW

We evaluated the economics of and problems involved in implementing PMS using a code-sort concept. We made our review primarily at Service headquarters, Washington, D.C., and

--evaluated appropriate policies, procedures, studies, reports, and contracts relating to PMS and LMCSS, particularly the CSC computer programs used as a basis for its report dated June 1972 on alternative systems for processing letter mail which is being used as a basis for justifying PMS and LMCSS;

--made field visits to the Cincinnati LMCSS prototype;

--analyzed performance statistics for the LMCSS prototype; and

--interviewed Service officials at Washington, D.C., and Cincinnati, Ohio, and officials of CSC, Falls Church, Virginia; the Institute for Defense Analyses, Arlington, Virginia; and IBM, Gaithersburg, Maryland.

United States Senate
COMMITTEE ON
POST OFFICE AND CIVIL SERVICE
WASHINGTON, D.C. 20510

August 1, 1973

The Honorable Elmer B. Staats
Comptroller General of the United States
General Accounting Office
Washington, D. C. 20548

Dear Elmer:

For some time, the Committee on Post Office and Civil Service of the Senate has been interested in the proposed preferential mail system of the U.S. Postal Service, as well as the alternative methods of mechanized letter sorting. This interest was reflected in my letter of July 10, 1973 in which I requested of you a disinterested analysis and report on the Institute for Defense Analysis Report R-186.

In your testimony to the Committee on July 26, 1973, you referred to a review now underway on the preferential mail system and the equipment proposed to be installed, including the different alternatives for processing letter mail. This current review appears to deal with the same subject matter, but in somewhat broader guage.

Timely information on the economic feasibility of the alternative systems, their impact upon service, and other factors involved, is of great importance to the Committee at this time, not only because of the time strictures facing the Committee but because actions, such as the commitment to capital investment, deserve an informed review by the Committee.

Consequently, I am asking that the Committee, in place of the report requested in my letter of July 10, 1973, be provided with a report on the preferential mail system to include a comparative analysis of the alternative letter sort systems and their impact on service standards. The Committee would greatly appreciate a report as comprehensive as possible within its rather urgent time requirement. A report by mid-September or as near thereto as possible, would be most useful. In general, our need is for the information as soon as possible.

It is my hope that this request might obviate the withdrawal of resources from your current preferential mail review in order to accomplish a narrower analysis of the I.D.A. study, thus benefiting both the G.A.O., the Committee, and the public interest.

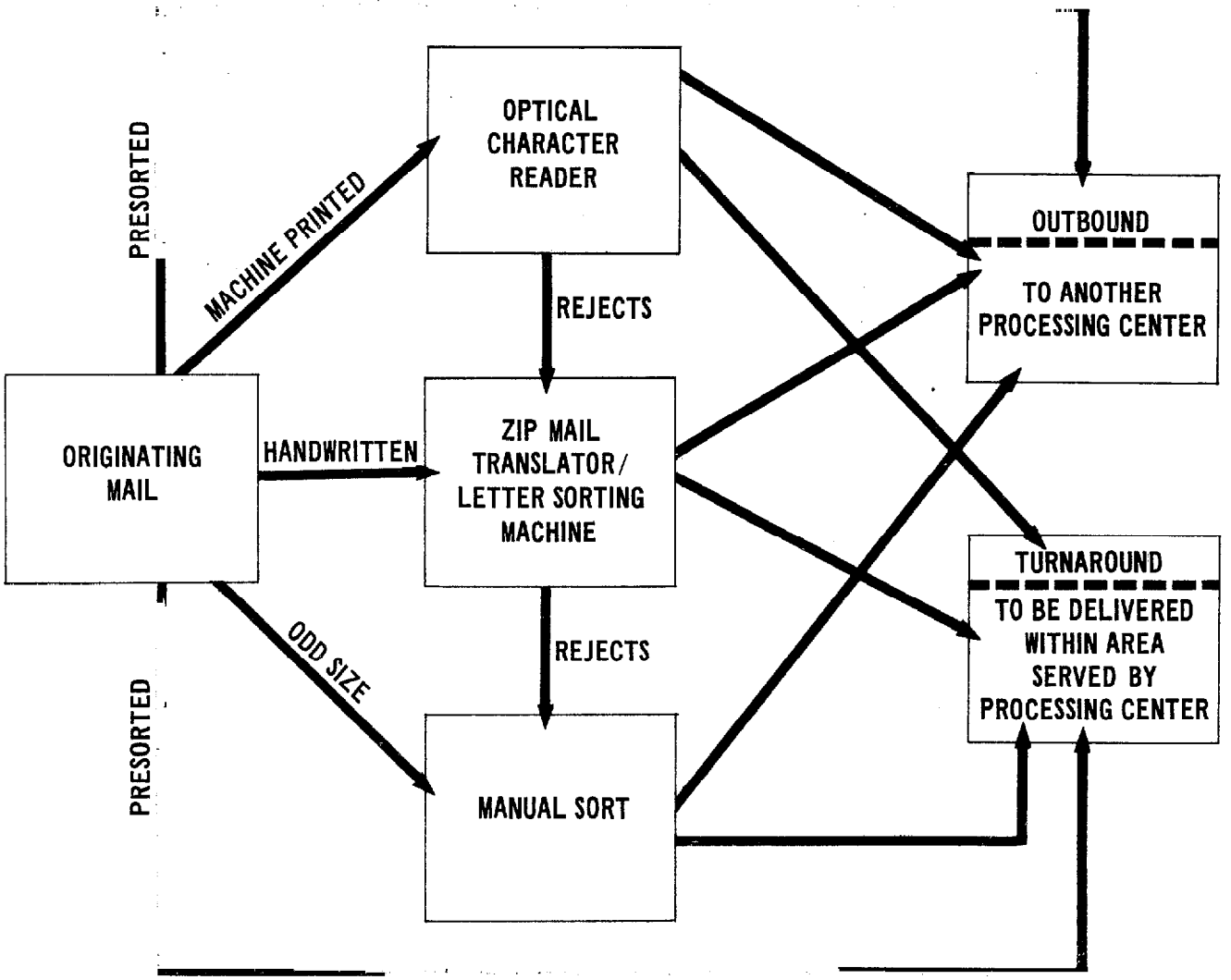
Thank you.

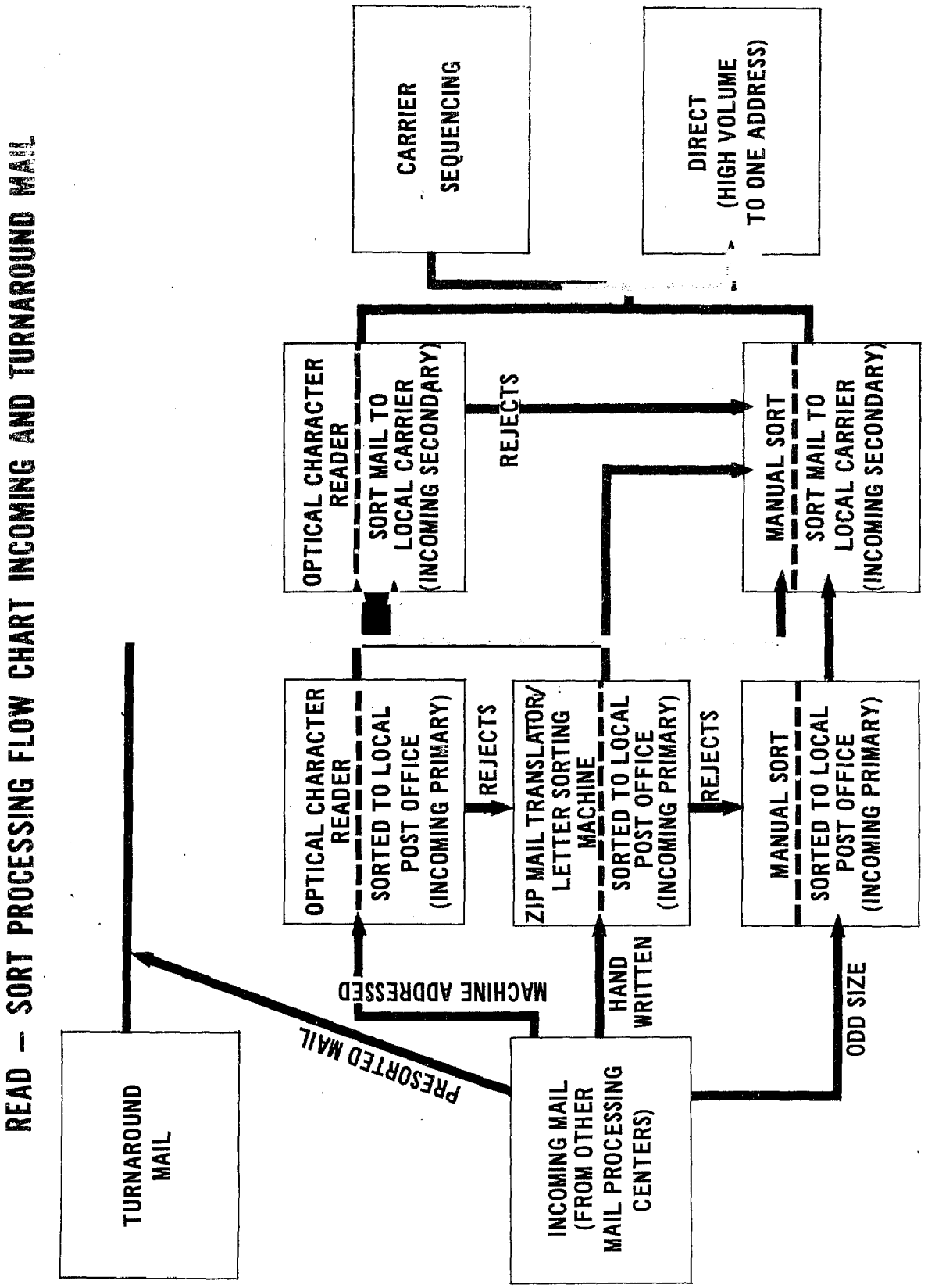
Sincerely,

GALE McGEE, Chairman

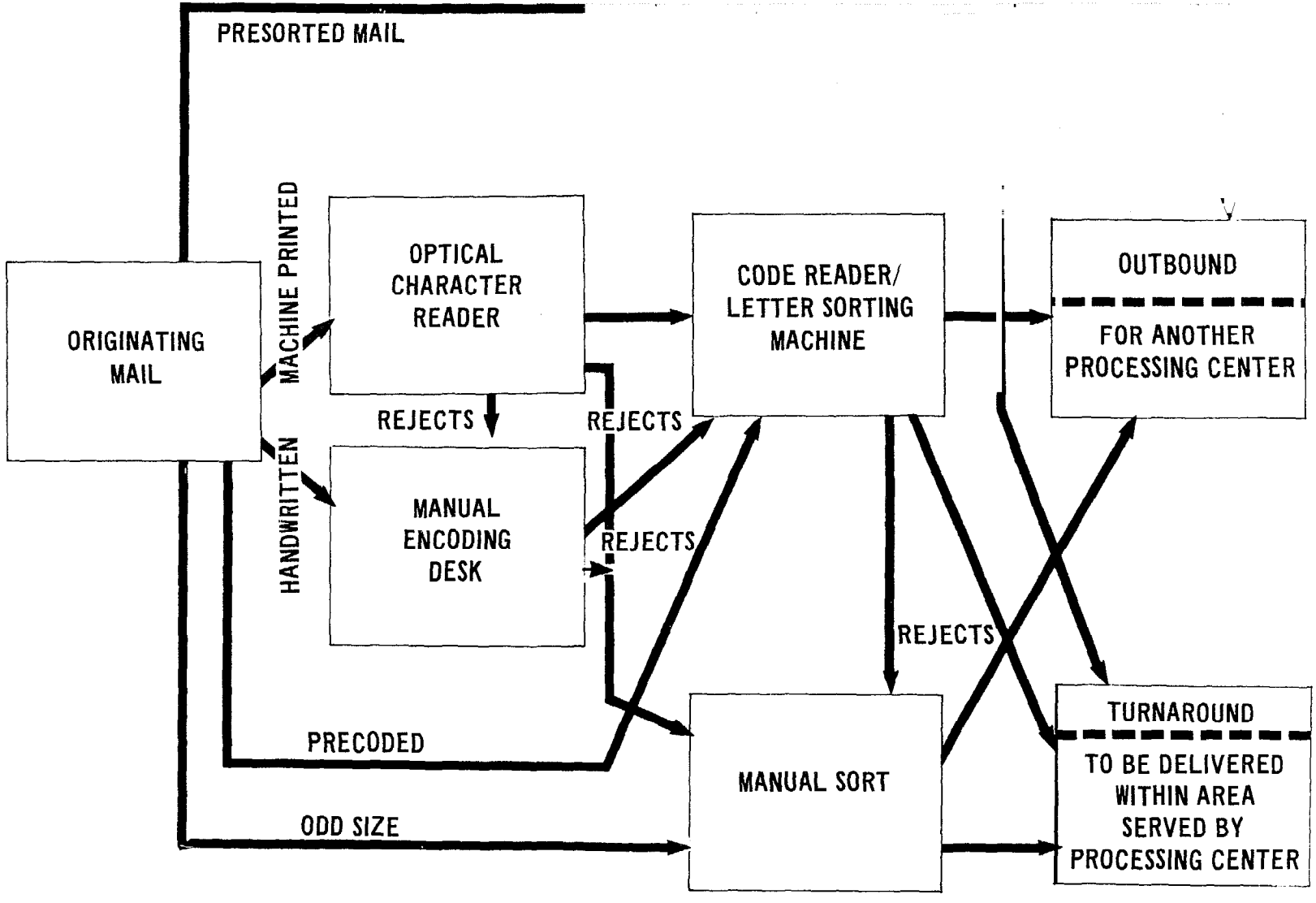
GM:ddk

READ – SORT PROCESSING FLOW CHART ORIGINATING MAIL

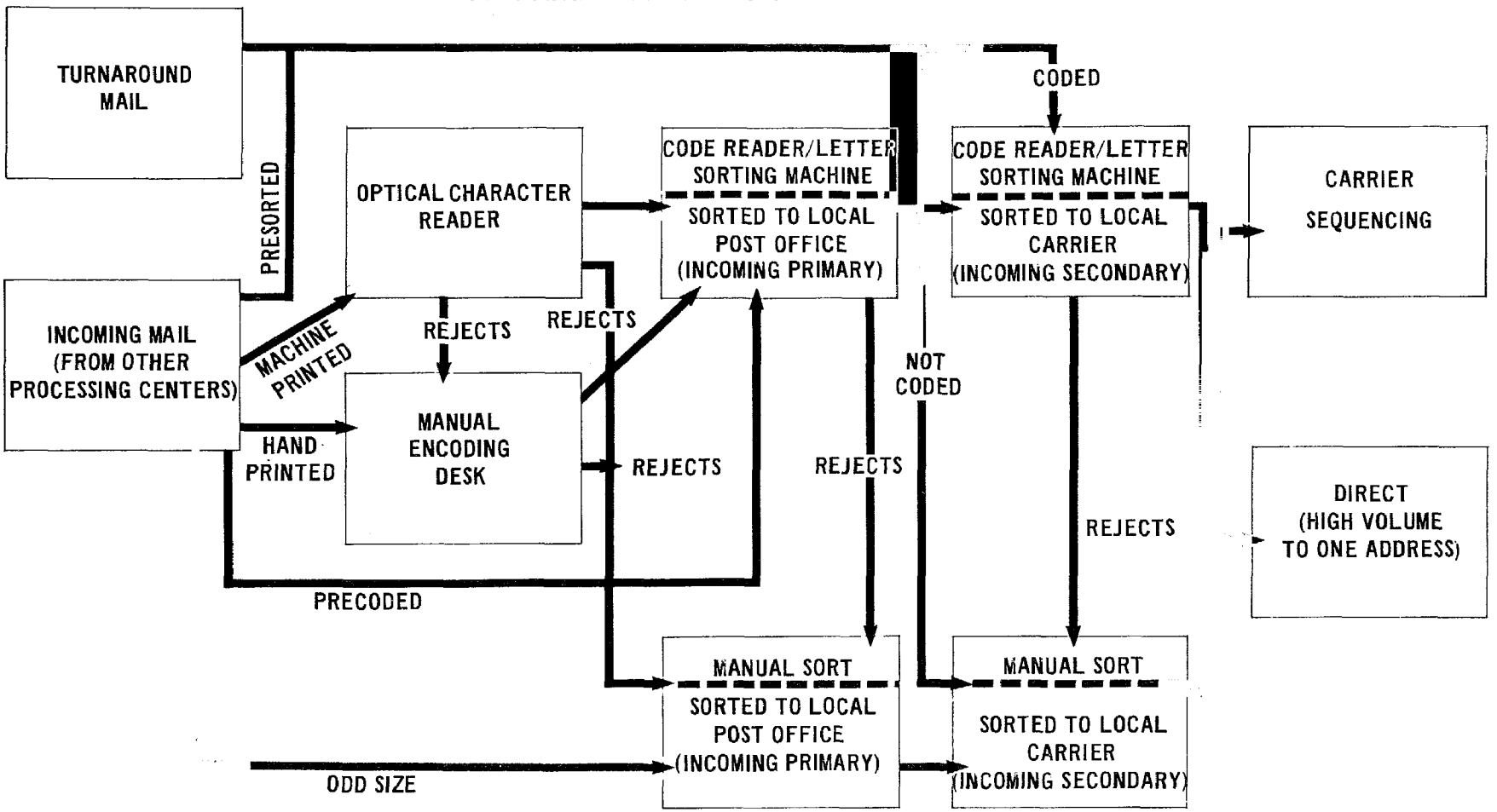



READ — SORT PROCESSING FLOW CHART INCOMING AND TURNAROUND MAIL
TURNAROUND MAIL
INCOMING MAIL (FROM OTHER MAIL PROCESSING CENTERS)
PRESORTED MAIL
MACHINE ADDRESSED
HAND WRITTEN
ODD SIZE
OPTICAL CHARACTER READER
SORTED TO LOCAL POST OFFICE (INCOMING PRIMARY)
REJECTS
ZIP MAIL TRANSLATOR/ LETTER SORTING MACHINE
SORTED TO LOCAL POST OFFICE (INCOMING PRIMARY)
REJECTS
MANUAL SORT
SORTED TO LOCAL POST OFFICE (INCOMING PRIMARY)
OPTICAL CHARACTER READER
SORT MAIL TO LOCAL CARRIER (INCOMING SECONDARY)
REJECTS
MANUAL SORT
SORT MAIL TO LOCAL CARRIER (INCOMING SECONDARY)
CARRIER SEQUENCING
DIRECT (HIGH VOLUME TO ONE ADDRESS)

CODE – SORT PROCESSING FLOW CHART ORIGINATING MAIL



CODE SORT PROCESSING FLOW CHART INCOMING AND TURNAROUND MAIL



GAO CHANGES TO CSC COMPUTER PROGRAMS AND COMMENTS MADE BY CSC OFFICIALS

FIXED COSTS

CSC's fixed costs included equipment amortization, some equipment maintenance, spare parts, and equipment space. Spare parts costs were computed on a yearly basis. Because spare parts are more properly a variable cost, we computed these costs on the basis of hours of operation. A CSC official agreed with this change.

HOURS OF OPERATIONS

In its code-sort program, CSC provided for a 12-hour day operation for all machines except for the mail preparation line, the mechanical carrier sequencer, and the code-sort input unit; in its read-sort program, CSC provided for a 16-hour day operation for all machines except for OCRs and LSM/ZMTs used in the outgoing primary sort operation and for the mail preparation line. OCRs and LSM/ZMTs were to be operated 12 hours a day, and the mail preparation line was to be operated 3 hours a day. To make the read-sort and code-sort programs consistent, we provided for a 16-hour day operation for all machines except for the mechanical carrier sequencer and the input unit in the code-sort program and the mail preparation line in both programs. As in the CSC programs, we provided 3 hours a day for the sequencer and the mail preparation line, and 10.667 hours a day for the code-sort input unit. A CSC official agreed that hours of operation should be consistent between the two systems. Although he did not specifically agree that 16 hours of daily operation was correct, he said that the figure chosen would not affect the decision so long as it was consistent between the two systems.

FIXED COSTS TO BE INCURRED FOR MACHINES

In determining the fixed costs to be incurred for machines required under a system, CSC provided for the first unit to be charged as fixed costs when the daily volume reached 50 percent of the total daily capacity for the unit. No fixed charges were incurred unless 50 percent or more of the capacity was used. This also applied to subsequent

units; for example, if the processing capacity needed was computed at 1.49 units or less, fixed charges would be applied for only one unit.

We determined that fixed costs would be incurred for at least one unit at all processing locations to account for such costs when a unit is needed and that fixed costs would be incurred for an additional unit each time the work exceeded a machine's daily processing capacity by 10 percent. Although the percentage used would have an insignificant effect on the relative costs of the two systems, 10 percent is more reasonable. This translates into using a machine for about 18 hours a day under both systems (16 hours of daily operation plus 10-percent additional use) rather than 18 hours a day under the code-sort system (12 hours of daily operation plus 50-percent additional use) and 24 hours a day under the read-sort system (16 hours of daily operation plus 50-percent additional use), which was the effect of the CSC programs. A CSC official said that our change was justified because we were using a 16-hour operating day and because of the need to be consistent.

KEYSTROKE RATE

The CSC code-sort program assumes that each manual encoding desk operator will achieve a rate of 10,080 keystrokes an hour; the CSC read-sort program assumes that the performance rate for the LSM/ZMT will be 28,100 letters an hour. The LSM/ZMT has 12 operating desks, each manned by one person. The average rate for each desk would therefore be about 2,340 letters an hour. The LSM/ZMT requires not more than three keystrokes per letter. Total keystrokes an hour per desk would be about 7,020. The manual encoding desk and the LSM/ZMT are similar in that each has operators and keyboards. The keyboard for the LSM/ZMT contains less keys than the manual encoder.

The mail processed by both machines in highly mechanized code-sort and read-sort systems would be primarily handwritten mail. We therefore believe that the keystroke rate for the manual encoder would be no more than or perhaps less than that of the LSM/ZMTs.

Because LSM/ZMTs have been in operation for several years and the 28,100 letter rate was apparently based on actual experience, we used the keystroke rate of 7,020 an hour in our code-sort program. In this respect, an IBM report dated March 6, 1973, showed that the useful keystroke rate[1] for the manual encoding desks on the basis of charged time (including two 15-minute breaks within every 8 charged hours and any occupied downtime) was 6,500 keystrokes an hour, whereas the useful keystroke rate for the LSM/ZMT was about 7,300 keystrokes an hour. The keystroke rate for encoding desks, as IBM determined, was based on LMCSS statistics at Cincinnati gathered for January 1973, whereas the LSM/ZMT rate was based on actual experience at various postal facilities. An IBM official said that, according to a motion expert, there would be a 10-percent degradation in the computed code desk keystroke rate upon national deployment because of the test environment at Cincinnati which is conducive to optimum performance. A CSC official did not specifically agree with our change but agreed to review the reasonableness of the keystroke rates used in its analyses.

PRESORTED AND PRECODED MAIL

The CSC code-sort and read-sort computer programs both assume that 7 percent of the originating mail is presorted. The code-sort program also assumes that 15 percent of the remaining originating mail will be precoded by the mailers. Any effort to gain mailers' cooperation in precoding their mail would result in additional precoded mail for a code-sort system. A similar effort would provide additional presorted mail for the read-sort system. To provide an equitable comparison between code-sort and read-sort programs, the read-sort program should be credited with a larger amount of presorted mail. According to our read-sort program:

1. Fifteen percent of originating mail is presorted. The outbound portion of this mail is routed directly to the outbound dock. The turnaround portion is sent to the OCR incoming secondary sort.

2. Fifteen percent of incoming mail is presorted and is routed to the OCR incoming secondary sort.

[1] Total keystrokes less nonproductive keystrokes, such as rejects, backspace, and cancels.

According to our code-sort program:

1. Seven percent of originating mail has been precoded and presorted. Because the mail is presorted, the outbound portion goes directly to the outbound dock. The turnaround portion is sent to the code reader/LSM where it is sorted in one pass to high-volume customers (incoming directs) or carrier sequencing.

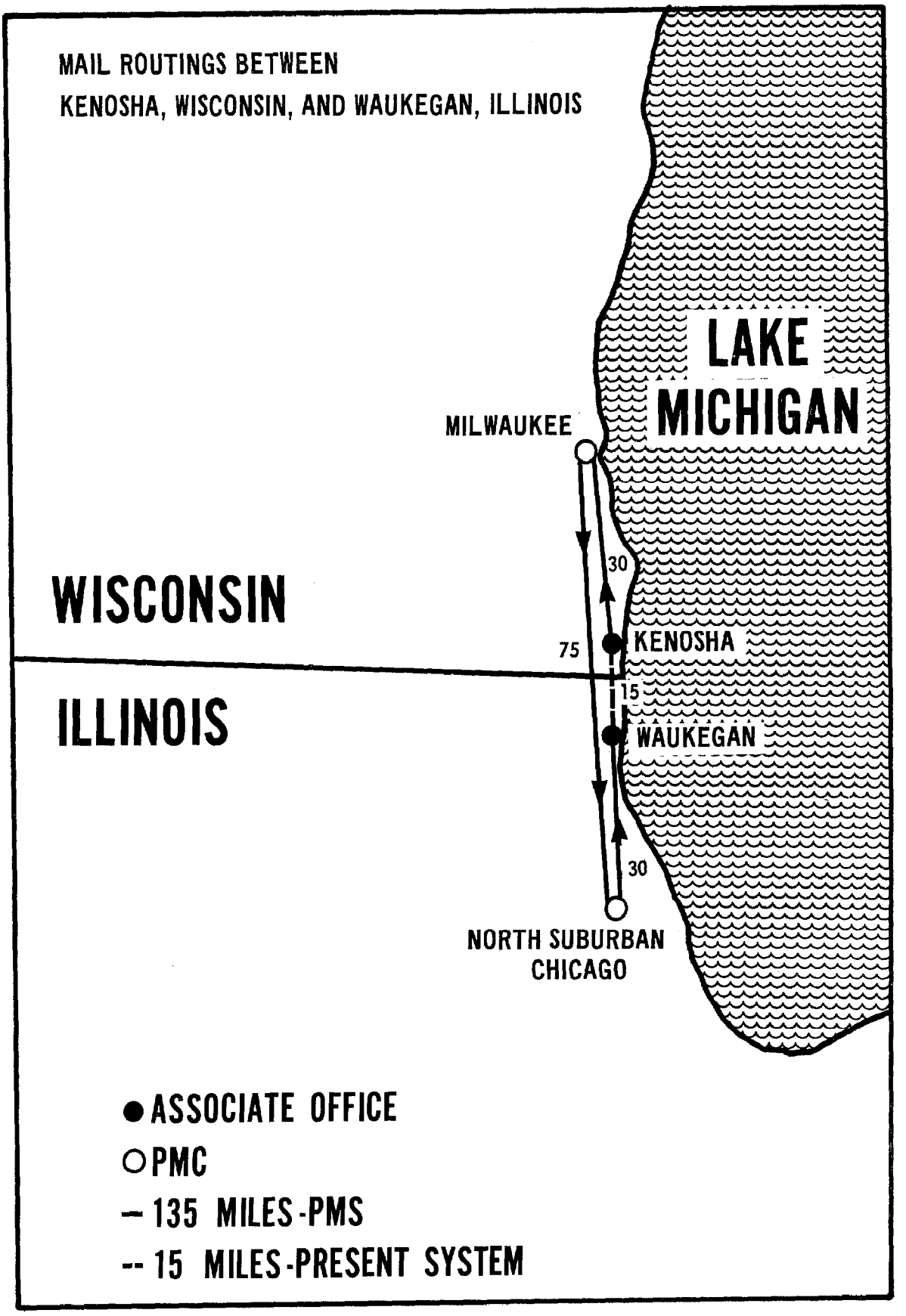
2. Because 7 percent of the originating mail is precoded and presorted, therefore 7 percent of the incoming mail is precoded and is sent to the code reader for sorting.

3. Fifteen percent of the remaining originating mail and 15 percent of the remaining incoming mail is also precoded and sent directly to a code reader/LSM.

A CSC official did not specifically agree with our change. There is some advantage for code-sort, according to this official, in that it is easy for mailers to precode business reply mail. As shown above, however, we did provide that more mail would be precoded under the code-sort system than would be presorted under the read-sort system.

LSM/ZMT REJECT RATE TO MANUAL SORTING

CSC used a reject rate of 7 percent plus one-half the percentage that un-ZIP-coded mail is of the total mail in the area. This resulted in an average reject rate of 18 percent. We do not dispute the use of one-half of the un-ZIP-coded mail in the reject rate; however, the 7-percent figure is questionable. In its code-sort program, CSC used a reject rate of 2.65 percent for the manual encoder. As explained earlier, since the LSM/ZMT and manual encoder are both operated by a person sitting at a console and striking keys, it is unlikely that the reject rate (other than for the un-ZIP-coded mail) would be different. Therefore, we used a reject rate for the LSM/ZMT of 2.65 percent plus one-half of the percentage of un-ZIP-coded mail. A CSC official agreed that its approach was inconsistent and said that CSC would review the reasonableness of the rates used in its study.


MAIL ROUTINGS BETWEEN
KENOSHA, WISCONSIN, AND WAUKEGAN, ILLINOIS
LAKE
MICHIGAN
MILWAUKEE
WISCONSIN
30
75
KENOSHA
15
ILLINOIS
WAUKEGAN
30
NORTH SUBURBAN
CHICAGO
● ASSOCIATE OFFICE
○ PMC
— 135 MILES-PMS
-- 15 MILES-PRESENT SYSTEM

APPENDIX VIII